Method To Determine Personalized Transcranial Magnetic Stimulation (Tms) Parameters To Enhance Clinical Treatment Outcomes In Major Depression And Neurological Disorders

Published date: Aug. 28, 2019

Technology description

Summary

Researchers led by Aimee Hunter from the Department of Psychaitry at UCLA have developed a methodology to determine parameters for personalized transcranial magnetic stimulation to treat depression.

Background

Depression affects millions of people each year, and about 30% of these individuals do not respond to anti-depressants. Neuomodulation techniques like deep brain stimulation (DBS) and transcranial magnetic stimulation (TMS) offer alternative methods for treatment-resistant depression. The effectiveness of TMS and DBS vary widely from patient to patient, due to the uniqueness of each person's brain. Different parameters of TMS can be changed (location, duration, frequency, patter of stimulation, etc.) for each patient to achieve optimal clinical outcomes. However, the current process to personalize TMS for patients involves a manual trial and error approach that begins with a "standard" set of parameters that progress through a sequence of alternative settings, with each progression lasting weeks at a time. This process is too time-consuming and can lead patients to abandon TMS before it shows any promise.

Innovation

Researchers led by Aimee Hunter from the Department of Psychaitry at UCLA have developed a methodology to determine parameters for personalized transcranial magnetic stimulation to treat depression. Using a wireless EEG headset, these researchers have found a biomarker after a week of treatment that can predict the effectiveness of the TMS parameters over the course of six weeks. Using this same biomarker, the researchers can adjust and personalize TMS stimulation parameters each week until an optimal outcome has been achieved. This methodology is approximately 3-5x quicker in finding optimal parameters as opposed to the old "trial and error" methods used before where the settings could only be changed after a few weeks of treatment.

Application area

Personalized neuromodulation

Depression

Any neurological disorder that requires neuromodulation

Advantages

Automated

Quicker

Personalized

Institution

University of California, Los Angeles

Inventors

Aimee Hunter

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